Nanostructure Synthesis using Reactive Block Copolymers

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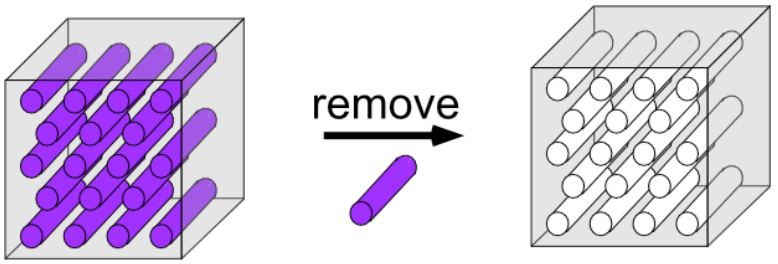
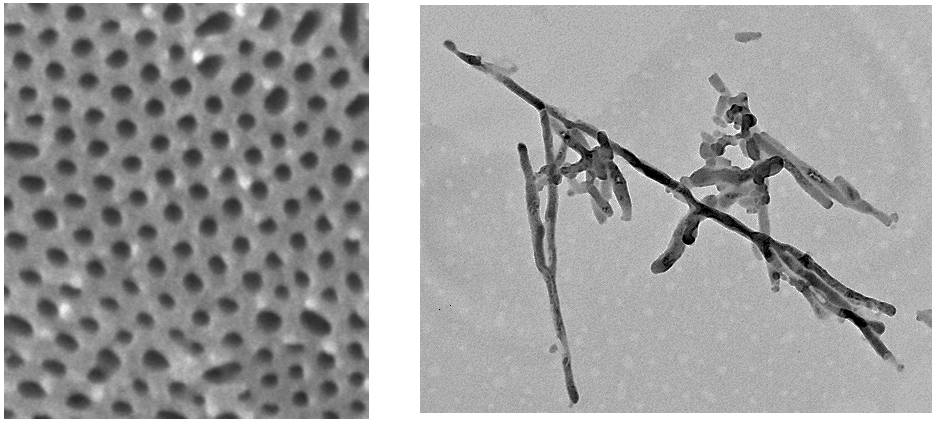
Diblock copolymers self-assemble into predictable ordered nanostructures.We have exploited this generic behavior using block copolymers containing a sacrificial component, polylactide (PLA). With PLA block copolymers as precursors we have prepared a variety of nanoporous plastics. The product nanoporous materials exhibit high surface areas, controlled pore sizes, good thermal stability, and tunable pore wall functionality. Potential applications for these materials include separation media, nanotemplates, and supports for high-surface-area catalysis.

Langmuir **2003**, *19*, 6553.



Removal of a sacrificial component (purple, polylactide) from an ordered block copolymer precursor that forms hexagonally packed cylinders (diameter 5 - 50 nm)



Nanoporous polycyclohexylethylene with 31 nm pores (left) and polypyrrole nanowires synthesized using this nanoporous material as a template (right)